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EXAMINER

GU, YU

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/562,617	<b>Applicant(s)</b> DRIESEN ET AL.	
	<b>Examiner</b> YU (Andy) GU	<b>Art Unit</b> 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/22/2005</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. **Claims 1-30** are presented for examination.

#### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). A certified copy has been filed with the application on 12/22/2005.

#### ***Information Disclosure Statement***

3. The information disclosure statements (IDS) submitted on 12/22/2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

#### ***Claim Objections***

4. **Claims 2, 3, 16** and **17** are objected to because of the following informalities:  
Above cited claims recite the limitation "*said grouped*", which claims antecedent basis in claim 1 as in "*wherein said subcarriers are grouped into a plurality of subcarrier groups*". However, "grouped" in the cited context is an adjective, not a verb; therefore it is informal to be used in the context of above cited claims, which attempt to further limit an action. The Examiner suggesting changing "*said grouped*" to "the grouping".  
Appropriate correction is required.

5. **Claim 11** and **24** are objected to because of grammatical informalities. Claim 11 recites the limitation "*each of said long training symbols are orthogonal in frequency domain*". Such language is grammatically incorrect (e.g. each are). Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claim 27 and 30** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 27 and 30** each recites the limitation "*said indicated duration*". There is insufficient antecedent basis for this limitation in the claim. For the purpose of this examination, "*said indicated duration*" is interpreted as "an indicated duration".

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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7. **Claims 1, 4, 8-10, 12-13, 15, 18, 22-23 and 25-30** are rejected under 35 U.S.C. 102(e) as being anticipated by US 7352688 B1 Perahia et al. (hereinafter Perahia).

Regarding **claim 1**, Perahia discloses *a method for transmitting data in a multiple antenna communication system having N (see at least column 4 lines 16-21) transmit antennas (see at least Abstract), said method comprising the step of:*

- *transmitting a legacy preamble having at least one long training symbol (see at least column Figure 5 lines 24-45),*
- *and at least one additional (e.g. two long training symbols as shown in Figure 5) long training symbol on each of said N transmit antennas(see at least column Figure 5 lines 24-45),*
- *each of said long training symbols having a plurality (e.g. 64 subcarrier values) of subcarriers (see at least column 3 lines 50-67),*
- *wherein said subcarriers are grouped into a plurality of subcarrier groups (e.g. by virtue of multiple antennas, each of these antennas is used to transmit OFDM symbols modulated by a group of 64 subcarriers, e.g. two antennas requires two groups of 64 sub-carriers, see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27),*
- *and wherein each subcarrier group is transmitted on a different transmit antenna in a given time interval (see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27) .*

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Regarding **claim 4**, Perahia discloses the limitations as shown in the rejection of claim

1. Perahia further discloses:

- *wherein each of said transmit antennas transmits a total of N (e.g. 2) long training symbols (see at least Figure 5 and column 6 lines 29-45).*

Regarding **claim 8**, Perahia discloses the limitations as shown in the rejection of claim

1. Perahia further discloses:

- *wherein said legacy preamble further comprises at least one short training symbol (see at least Figure 5 and column 5 lines 30-35).*

Regarding **claim 9**, Perahia discloses the limitations as shown in the rejection of claim

1. Perahia further discloses:

- *wherein said legacy preamble further comprises at least one SIGNAL field (see at least Figure 5 and column 6 lines 52-57).*

Regarding **claim 10**, Perahia discloses the limitations as shown in the rejection of claim

1. Perahia further discloses:

- *wherein said legacy preamble is an 802.11 a/g preamble (see at least column 6 lines 32-36).*

Regarding **claim 12**, Perahia discloses the limitations as shown in the rejection of claim

1. Perahia further discloses:

- *wherein N is two and wherein said transmitting step further comprises (see at least Figure 1-3)*

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- *the step of transmitting a legacy preamble having at least one long training symbol and one additional long training symbol (e.g. total of 2 LTS) on each of said two transmit antennas (see at least Figure 5),*
- *wherein half of the subcarriers (e.g. subcarrier 0-31 of the 64 subcarriers, along with the subcarrier 32-64 of the 64 subcarriers) of the long training symbol are in a first subcarrier group (as applied to the first antenna) and the remaining half of the subcarriers (e.g. subcarrier 32-64 of the 64 subcarriers, along with the subcarrier 0-31 of the 64 subcarriers) of the long training symbol are in a second subcarrier group (e.g. as applied to the second antenna) (see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27).*

Regarding **claim 13**, Perahia discloses the limitations as shown in the rejection of claim

1. Perahia further discloses:

- *whereby a lower order receiver (e.g. SISO receiver) can interpret said transmitted data (see at least column 9 lines 44-65).*

Regarding **claim 15**, Perahia discloses a *transmitter in a multiple antenna communication system, comprising:*

- *N transmit antennas (see at least Figure. 3) for transmitting a legacy preamble having at least one long training symbol (see at least column Figure 5 lines 24-45),*

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- *and at least one additional long training symbol*(e.g. two long training symbols as shown in Figure 5) *on each of said N transmit antennas* (see at least column Figure 5 lines 24-45),
- *each of said long training symbols having a plurality of subcarriers*(see at least column 3 lines 50-67),
- *wherein said subcarriers are grouped into a plurality of subcarrier groups* (e.g. by virtue of multiple antennas, each of these antennas is used to transmit OFDM symbols modulated by a group of 64 subcarriers, e.g. two antennas requires two groups of 64 sub-carriers, see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27),
- *and wherein each subcarrier group is transmitted on a different transmit antenna in a given time interval* (see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27).

Regarding **claim 18**, Perahia discloses the limitations as shown in the rejection of claim

**15**. Perahia further discloses:

- *wherein each of said transmit antennas transmits a total of N long training symbols* (see at least Figure 5 and column 6 lines 29-45).

Regarding **claim 22**, Perahia discloses the limitations as shown in the rejection of claim

**15**. Perahia further discloses:

- *wherein said legacy preamble further comprises at least one SIGNAL field* (see at least Figure 5 and column 6 lines 52-57).



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Regarding **claim 23**, Perahia discloses the limitations as shown in the rejection of claim

**15.** Perahia further discloses:

- *wherein said legacy preamble is an 802.11 a/g preamble(see at least column 6 lines 32-36).*

Regarding **claim 25**, Perahia discloses the limitations as shown in the rejection of claim

**15.** Perahia further discloses:

- *wherein N is two and wherein said two transmit antennas comprises (see at least Figure 1-3) transmit a legacy preamble having at least one long training symbol and one additional long training symbol (e.g. total of 2 LTS) on each of said two transmit antennas (see at least Figure 5), wherein half of the subcarriers(e.g. subcarrier 0-31 of the 64 subcarriers, along with the subcarrier 32-64 of the 64 subcarriers) of the long training symbol are in a first subcarrier group (as applied to the first antenna) and the remaining half (e.g. subcarrier 32-64 of the 64 subcarriers, along with the subcarrier 0-31 of the 64 subcarriers) of the subcarriers of the long training symbol are in a second subcarrier group(e.g. as applied to the second antenna) (see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27).*

Regarding **claim 26**, Perahia discloses the limitations as shown in the rejection of claim

**15.** Perahia further discloses:

- *whereby a lower order receiver (e.g. SISO receiver) can interpret said transmitted data(see at least column 9 lines 44-65).*

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Regarding **claim 27**, Perahia discloses *a method for receiving data* (see at least Figure 2) *on at least one receive antenna transmitted by a transmitter having N* (see at least column 4 lines 16-21) *transmit antennas in a multiple antenna communication system, said method comprising the steps of:*

- *receiving a legacy preamble having at least one long training symbol and an indication of a duration of a transmission of said data,*
  - *and at least one additional long training symbols on each of said N transmit antennas*(see at least column Figure 5 lines 24-45),
  - *each of said long training symbols having a plurality of subcarriers*(e.g. 64 subcarrier values) *of subcarriers* (see at least column 3 lines 50-67),
  - *wherein said subcarriers are grouped into a plurality of subcarrier groups*(e.g. by virtue of multiple antennas, each of these antennas is used to transmit OFDM symbols modulated by a group of 64 subcarriers, e.g. two antennas requires two groups of 64 sub-carriers, see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27),
  - *and wherein each subcarrier group is transmitted on a different transmit antenna in a given time interval* (see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27);
- *and deferring for an indicated duration* (see at least Figure 5 and column 6 lines 38-45).

Regarding **claim 28**, Perahia discloses the limitations as shown in the rejection of claim 27. Perahia further discloses:

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- *wherein said method is performed by a SISO receiver (e.g. a receiver capable of SISO operation, see at least Figure 4, and column 9 lines 44-67)*

Regarding **claim 29**, Perahia discloses the limitations as shown in the rejection of claim **27** and **29**. Perahia further discloses:

- *wherein said indication is transmitted in a SIGNAL field that complies with the 802.11 a/g standards (see at least column 6 lines 47-57).*

Regarding **claim 30**, Perahia discloses *a receiver (i.e. wireless bridge as shown Figure.1) in a multiple antenna communication system having at least one transmitter having N (see at least column 4 lines 16-21) transmit antennas (see at least Figure 3), comprising:*

- *at least one receive antenna for receiving a legacy preamble having at least one long training symbol and an indication of a duration of a transmission of said data(see at least column Figure 5 lines 24-45),,*
  - *and N-1 additional (see at least column Figure 5 lines 24-45, where N is 2 in Perahia's instant embodiment) long training symbols on each of said N transmit antennas,*
  - *each of said long training symbols having a plurality (e.g. 64 subcarrier values) of subcarriers (see at least column 3 lines 50-67),*
  - *wherein said subcarriers are grouped into a plurality of subcarrier groups(e.g. by virtue of multiple antennas, each of these antennas is used to transmit OFDM symbols modulated by a group of 64 subcarriers, e.g.*

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two antennas requires two groups of 64 sub-carriers, see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27),

- *and wherein each subcarrier group is transmitted on a different transmit antenna in a given time interval ( see at least column 3 lines 54-60, column 4 lines 17-22 and column 5 lines 16-27);*
- *and **means** for deferring for said indicated duration (see at least Figure 5 and column 6 lines 38-45).*

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claim 2, 5, 6, 11, 16, 19, 20 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Perahia in view of US 20040141548 A1 Shattil (hereinafter Shattil).

Regarding **claim 2**, Perahia discloses the limitations as shown in the rejection of claim

**1**. Perahia further discloses that the subcarriers used to modulate a symbol can be grouped (e.g. specified, see at least column 6 lines 58-65). Perahia does not disclose that *the grouping is based on a blocking technique*. However, in an analogous field of endeavor, Shattil teaches using different sets (blocks of subcarrier, more specifically when one block of subcarrier is used to modulate a symbol, the said block of subcarrier thus blocking other subcarriers from being used, therefore a blocking technique) of

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subcarriers to transmit symbols (see at least Shattil paragraph [0081]). It would have been obvious to a person of ordinary skill in the art to modify Perahia by applying the blocking technique taught by Shattil in order to improve efficiency and performance, as discussed by Shattil.

Regarding **claim 5**, Perahia discloses the limitations as shown in the rejection of claim

**1**. Perahia further discloses that the subcarriers used to modulate a symbol can be grouped (e.g. specified, see at least column 6 lines 58-65). Perahia does not specifically teach *wherein said subcarrier groups transmitted by a given transmit antenna are varied for each of the N long training symbols transmitted by said given transmit antenna*.

However, in an analogous field of endeavor, Shattil teaches using different groups of subcarriers to modulate a symbol (see at least Shattil paragraph [0081]). It would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Shattil in order to improve efficiency and performance, as discussed by Shattil.

Regarding **claim 6**, Perahia discloses the limitations as shown in the rejection of claim **1**

and **5**. Perahia further discloses that the subcarriers used to modulate a symbol can be grouped (e.g. specified, see at least column 6 lines 58-65). Perahia does not specifically teach *wherein after transmission of said N long training symbols by each of said N transmit antennas, each of said N transmit antennas has transmitted each subcarrier of said long training symbols only once*. However, in an analogous field of endeavor,

Shattil teaches using different groups of subcarriers to modulate a symbol (see at least Shattil paragraph [0081]), therefore if a different set of subcarrier is applied to a different symbol e.g. the mapping is one to one, then the set of subcarriers will only be

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transmitted once for that series of symbols). It would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Shattil in order to improve efficiency and performance, as discussed by Shattil.

Regarding **claim 11**, Perahia discloses the limitations as shown in the rejection of claim

**1**. Perahia does not specifically teach *wherein each of said long training symbols are orthogonal in the frequency domain*. However, in an analogous field of endeavor, Shattil teaches using different groups of subcarriers to modulate a symbol (see at least Shattil paragraph [0081], therefore symbols modulated by different groups of subcarriers, which are orthogonal due to the nature of OFDM, are orthogonal as well). It would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Shattil in order to improve efficiency and performance, as discussed by Shattil.

Regarding **claim 16**, Perahia discloses the limitations as shown in the rejection of claim

**15**. Perahia further discloses that the subcarriers used to modulate a symbol can be grouped (e.g. specified, see at least column 6 lines 58-65). Perahia does not disclose that *the grouping is based on a blocking technique*. However, in an analogous field of endeavor, Shattil teaches using different sets (blocks of subcarrier, more specifically when one block of subcarrier is used to modulate a symbol, the said block of subcarrier thus blocking other subcarriers from being used, therefore a blocking technique) of subcarriers to transmit symbols (see at least Shattil paragraph [0081]). It would have been obvious to a person of ordinary skill in the art to modify Perahia by applying the blocking technique taught by Shattil in order to improve efficiency and performance, as discussed by Shattil.

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Regarding **claim 19**, Perahia discloses the limitations as shown in the rejection of claim **15** and **18**. Perahia further discloses that the subcarriers used to modulate a symbol can be grouped (e.g. specified, see at least column 6 lines 58-65). Perahia does not specifically teach *wherein said subcarrier groups transmitted by a given transmit antenna are varied for each of the N long training symbols transmitted by said given transmit antenna*. However, in an analogous field of endeavor, Shattil teaches using different groups of subcarriers to modulate a symbol (see at least Shattil paragraph [0081]). It would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Shattil in order to improve efficiency and performance, as discussed by Shattil.

Regarding **claim 20**, Perahia discloses the limitations as shown in the rejection of claim **15**, **18** and **19**. Perahia further discloses that the subcarriers used to modulate a symbol can be grouped (e.g. specified, see at least column 6 lines 58-65). Perahia does not specifically teach *wherein after transmission of said N long training symbols by each of said N transmit antennas, each of said N transmit antennas has transmitted each subcarrier of said long training symbols only once*. However, in an analogous field of endeavor, Shattil teaches using different groups of subcarriers to modulate a symbol (see at least Shattil paragraph [0081], therefore if a different set of subcarrier is applied to a different symbol e.g. the mapping is one to one, then the set of subcarriers will only be transmitted once for that series of symbols). It would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Shattil in order to improve efficiency and performance, as discussed by Shattil.

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Regarding **claim 24**, Perahia discloses the limitations as shown in the rejection of claim **15**. Perahia does not specifically teach *wherein each of said long training symbols are orthogonal in the frequency domain*. However, in an analogous field of endeavor, Shattil teaches using different groups of subcarriers to modulate a symbol (see at least Shattil paragraph [0081], therefore symbols modulated by different groups of subcarriers, which are orthogonal due to the nature of OFDM, are orthogonal as well). It would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Shattil in order to improve efficiency and performance, as discussed by Shattil.

9. **Claim 3, 7, 17 and 21** is rejected under 35 U.S.C. 103(a) as being unpatentable over Perahia in view of US 20030123381 A1 Zhuang et al. (hereinafter Zhuang).

Regarding **claim 3**, Perahia discloses the limitations as shown in the rejection of claim **1**. Perahia further discloses that the subcarriers used to modulate a symbol can be grouped (e.g. specified, see at least column 6 lines 58-65). Perahia does not specifically teach the grouping is *based on an interleaving technique*. However, in an analogous field of endeavor, Zhuang discloses modulating OFDM symbol over interleaved subcarriers (i.e. interleaving technique). it would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Zhuang in order to fully realized the advantage of OFDM system as discussed by Zhuang(see at least Zhuang paragraph [0002]).

Regarding **claim 7**, Perahia discloses the limitations as shown in the rejection of claim **1**. Perahia does not specifically disclose *wherein a sequence of each of said long training symbols on each of said N transmit antennas are orthogonal*. However, in an



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analogous field of endeavor, Zhuang discloses modulating OFDM symbol using different subcarriers for different antenna (see at least paragraph [0019]), therefore symbols on each of the transmit antennas will be orthogonal due to modulation by orthogonal subcarriers. it would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Zhuang in order to fully realized the advantage of OFDM system as discussed by Zhuang (see at least Zhuang paragraph [0002]).

Regarding **claim 17**, Perahia discloses the limitations as shown in the rejection of claim **15**. Perahia further discloses that the subcarriers used to modulate a symbol can be grouped (e.g. specified, see at least column 6 lines 58-65). Perahia does not specifically teach the grouping is *based on an interleaving technique*. However, in an analogous field of endeavor, Zhuang discloses modulating OFDM symbol over interleaved subcarriers (i.e. interleaving technique). it would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Zhuang in order to fully realized the advantage of OFDM system as discussed by Zhuang(see at least Zhuang paragraph [0002]).

Regarding **claim 21**, Perahia discloses the limitations as shown in the rejection of claim **15**. Perahia does not specifically disclose *wherein a sequence of each of said long training symbols on each of said N transmit antennas are orthogonal*. However, in an analogous field of endeavor, Zhuang discloses modulating OFDM symbol using different subcarriers for different antenna (see at least paragraph [0019]), therefore symbols on each of the transmit antennas will be orthogonal due to modulation by orthogonal subcarriers. it would have been obvious to a person of ordinary skill in the art

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to modify Perahia in view of Zhuang in order to fully realized the advantage of OFDM system as discussed by Zhuang (see at least Zhuang paragraph [0002]).

6. **Claim 14** rejected under 35 U.S.C. 103(a) as being unpatentable over Perahia in view of US 7103325 B1 Jia et al.(hereinafter Jia)

Regarding **claim 14**, Perahia discloses the limitations as shown in the rejection of claim

1. Perahia does not specifically discloses *transmitting a field indicating said number N of transmit antennas*. However, in an analogous field of endeavor, Jia teaches transmitting to a receiver information regarding number of antennas used for communication (see at least column 6 lines 46-49 and column 8 lines 67 and column 9 lines 1-2). It would have been obvious to a person of ordinary skill in the art to modify Perahia in view of Jia to transmit the information regarding number of antennas used for the transmission in order to efficiently configure the communication device as taught by Jia.

### **Conclusion**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to YU (Andy) GU whose telephone number is (571)270-7233. The examiner can normally be reached on Mon-Thur 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester G. Kincaid can be reached on 5712727922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YU (Andy) GU/  
Examiner, Art Unit 2617

/Lester Kincaid/  
Supervisory Patent Examiner, Art Unit 2617